**Flash Research Assignment #1: Data Centers and Networking**

I propose that we invest in a Tier III data center, which will save us $13,299,056 over the next three years. In the past year, we have experienced 10 unscheduled outages to our ERP system, costing us $14,800 per minute of downtime. A majority of these outages are the result of inadequate facilities in our Tier I data center. When this system is down, the company cannot process orders, make product, or ship product. Upgrading to a Tier III system will increase availability from 99.67% to 99.98%, reducing downtime and saving a significant amount of money per year.

 Compared to Tier I, a Tier III data center has many advantages, such as a multiple distribution system and increased availability. While our Tier I is composed of only a single path for power and cooling distribution, a Tier III is composed of multiple active power and cooling distribution paths. This allows for the system to continue running because it can switch to another power source if an outage occurs in one of the power sources (Uptime Institute, LLC). Another advantage of a Tier III data center is that while our Tier I has nonredundant components, a Tier III has redundant components and are concurrently maintainable. This means that the system can still be up during downtown, such as during maintenance (Nixcraft). To put this into perspective, ur Tier I data center has 99.67% availability, which means that we have 1,734.48 minutes (28.91 hours) of downtown per year (Cappuccio). With a Tier III data center however, we would be running with 99.98% availability. These advantages make a Tier III data center much more valuable than our current Tier I center.

 Building a Tier III data center will take one year and cost $35,000,000. The financial benefits of this system will outweigh the costs in just two years. Every minute of downtown costs us $14,800. As shown in Table 1, downtime per year with our Tier I data center costs us an astonishing $25,670,304 per year. With a Tier III data center however, downtime would instead only cost us $1,555,776 per year. As Table 2 shows, this will save us $24,114,528 per year and provide net savings of $13,229,056 over three years (38% return on investment). These savings will continue every year after implementing the Tier III data center.

Table 1: Cost of Downtime

|  |  |  |  |
| --- | --- | --- | --- |
| Tier Level | Availability | Downtime (min/year) | Downtime cost in one year ($) |
| Tier I | 99.67% | 1,734.48 | $ 25,670,304.00 |
| Tier III | 99.98% | 105.12 | $ 1,555,776.00 |
|  |  |  |  |
|  |  | Net Savings per year | $ 24,114,528.00 |

Table 2: Cost and Benefit Analysis Over Three Years

|  |  |  |
| --- | --- | --- |
| Year | Costs | Benefits |
| 1 | $ (35,000,000.00) | $ 0 |
| 2 | $ 0 | $ 24,114,528.00 |
| 3 | $ 0 | $ 24,114,528.00 |
| Total | $ (35,000,000.00) | $ 48,229,056.00 |
|  |  |  |
| Net Savings (3 years) |  | $ 13,229,05.00 |
| Return on Investment | (48,229,056 – 35,000,000) / 35,000,000 = .33 |

**References**

“Data Center Site Infrastructure Tier Standard – Topology." Uptime Institute, LLC, 2000. Web.

<<http://community.mis.temple.edu/mis2501sec001f13/files/2013/08/Data-Center-Site-Infrastructure-Tier-Standar-Topology.pdf>>

Cappuccio, David J. "Ensure Cost Balances Out With Risk in High-Availability Data Centers." *Gartner.com*. Garner, 11 Feb. 2013. Web. 9 Sept. 2013.

<<http://my.gartner.com/portal/server.pt?open=512&objID=260&mode=2&PageID=3460702&resId=2333115&ref=QuickSearch&sthkw=data+center+infrastructure+tier+standards>>

Explain: Tier 1 / Tier 2 / Tier 3 / Tier 4 Data Center." *Frequently Asked Questions About Linux UNIX RSS*. Nixcraft, 29 Jan. 2011. Web. 9 Sept. 2013.

<<http://www.cyberciti.biz/faq/data-center-standard-overview/>>